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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/830,110	04/23/2004	Michael O. Cervenka	119479	9012
25944	7590	03/11/2005		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER VERDIER, CHRISTOPHER M	
			ART UNIT 3745	PAPER NUMBER
DATE MAILED: 03/11/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/830,110

Applicant(s)

CERVENKA

Examiner

Christopher Verdier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4-23-04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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Receipt and entry of Applicant's Preliminary Amendment dated April 23, 2004 is acknowledged.

### ***Drawings***

Figures 1-2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities: Appropriate correction is required.

On page 2, lines 22-23, "a pressure wall and a suction wall on respective sides of the aerofoil on one side of the platform cavity" is unclear.

On page 5, line 15, "or and" should be changed to -- and --.

On page 7, line 22, "48" should be changed to -- 46 --.

### ***Examiner's Suggestion to Claim Language***

The following is a suggestion to improve the clarity and precision of the claims:

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In claim 9, line 4, "a" may be changed to -- the --.

### ***Claim Objections***

Claims 1-10 are objected to because of the following informalities: Appropriate correction is required.

Claims 1-10 are replete with instances of the term "the said" (see claim 1, lines 1, 9, 10, 11, 12, etc.), which is objectionable. The term "the said" should be changed to -- the --, or should be changed to -- said --.

In claim 9, line 4, "vane" should be changed to -- vanes --.

In claim 10, line 3, "chamber(s)" should be changed to -- first and/or second chamber --.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, lines 6-7, "with a pressure wall and a suction wall on respective sides of the airfoil on one side of the platform cavity" is unclear as to how the pressure wall and suction wall, which are two different walls at two different locations, can be on one side of the platform. In claim 2, line 5, "the said cavity" is unclear if this refers to the aerofoil internal cavity, or the platform cavity.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 and 7-8, as far as they are definite and understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Dierberger 4,040,767. Note the nozzle guide vane 20 for a gas turbine engine, with the vane comprising an aerofoil having a pressure wall 26 and a suction wall 24 and at least one aerofoil internal cavity 28 between the pressure and suction walls for conveying cooling air through the aerofoil, and at least one aerofoil platform 22 adjacent and generally perpendicular to the aerofoil, the platform having at least one internal cavity with an unnumbered pressure wall and an unnumbered suction wall on respective sides of the aerofoil on one side of the platform cavity, the platform cavity being divided into at least two chambers including a first chamber 38 for receiving cooling air for cooling the platform pressure wall and a second chamber (located between baffle 40 and the inner wall of platform 22) for receiving cooling air for cooling the platform suction wall, wherein the first chamber is in flow communication at 42 with the aerofoil cavity for discharge of at least part of the cooling air entering the first chamber to the aerofoil cavity, with a plurality of impingement cooling holes 36 provided in a wall on an opposite side of the platform cavity to the platform pressure and suction walls for cooling the platform pressure and suction walls by the impingement of cooling air

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admitted, in use, into the cavity through the impingement cooling holes from an unnumbered common source, including a first set of impingement cooling holes (the left hand holes 44 in figure 2) for conveying cooling air into the first chamber and a second set of impingement cooling holes (the right hand holes 44 in figure 2) for conveying cooling air into the second chamber. The recitation in claim 2, lines 6-8 of "a first set of impingement cooling holes for conveying cooling air into the first chamber and a second set of impingement cooling holes for conveying cooling air into the second chamber" is a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963). The cooling holes 44 of Dierberger are capable of performing the intended use of conveying cooling air into both of the first and second chambers, and there is no structural difference recited in the claims. The first and second sets of impingement cooling holes are sized and spaced such that, in use, cooling air admitted to the first chamber (via the right hand holes 44) has a higher operational pressure than cooling air admitted to the second chamber (via the left hand holes 44), due to the smaller number of right hand holes 44 which will cause a higher pressure. The first and second sets of impingement cooling holes are sized and spaced such that in use, the flow of cooling air through the first holes (via the left hand holes 44) into the first chamber is greater than the flow of cooling air through the second holes (via the right hand holes) into the second chamber. Note

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that because claim 2 contains a recitation of intended use as set forth above, claims 3 and 4 are also recitations of intended use. The second chamber comprises plural cooling air exit apertures 36 at a downstream end of the platform. The platform pressure wall is provided with plural film cooling holes 36 for conveying cooling air from the first chamber to the external surface of the platform pressure wall to provide a film of cooling air over the external surface in use. The platform suction wall is provided with plural film cooling holes 36 for conveying cooling air from the second chamber to the external surface of the platform pressure wall to provide a film of cooling air over the external surface in use.

Claim 1, as far as it is definite and understood, is rejected under 35 U.S.C. 102(b) as being anticipated by Tomita 5,915,923 (figures 1-3). Note the turbine rotor blade 1 for a gas turbine engine, with the blade comprising an aerofoil having an unnumbered pressure wall and an unnumbered suction wall and at least one aerofoil internal cavity 52 between the pressure and suction walls for conveying cooling air through the aerofoil, and at least one aerofoil platform 21 adjacent and generally perpendicular to the aerofoil, the platform having at least one internal cavity 19, 19 with an unnumbered pressure wall and an unnumbered suction wall on respective sides of the aerofoil on one side of the platform cavity, the platform cavity being divided into at least two chambers including a first chamber 19 on the left side for receiving cooling air for cooling the platform pressure wall and a second chamber on the right side for receiving cooling air for cooling the platform suction wall, wherein the first chamber is in flow communication at 20 with the aerofoil cavity for discharge of at least part of the cooling air entering the first chamber to the aerofoil cavity. Note the recitation in claim 1, lines 3-4 of "for conveying cooling

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air through the aerofoil", the recitation in claim 1, lines 8-9 of "for receiving cooling air for cooling the said platform pressure wall", the recitation in claim 1, lines 9-10 of "for receiving cooling air for cooling the said platform suction wall", and the recitation in claim 1, last two lines of "for discharge of at least part of the cooling air entering first chamber to the said aerofoil cavity" are recitation of intended use, as set forth above. Although Tomita uses steam cooling of the aerofoil, the aerofoil is capable of being air cooled, and thus meets the recitations of intended use.

Claims 1 and 9-10, as far as they are definite and understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Endres 4,359,310 (figures 4-5). Note the nozzle guide vane 60 for a gas turbine engine, with the blade comprising an aerofoil 1'8 having an unnumbered pressure wall and an unnumbered suction wall and at least one aerofoil internal cavity 9 between the pressure and suction walls for conveying cooling air through the aerofoil, and at least one aerofoil platform 11 adjacent and generally perpendicular to the aerofoil, the platform having at least one internal cavity 13 with an unnumbered pressure wall and an unnumbered suction wall on respective sides of the aerofoil on one side of the platform cavity, the platform cavity being divided into at least two chambers including a first chamber on the left side for receiving cooling air for cooling the platform pressure wall and a second chamber on the right side for receiving cooling air for cooling the platform suction wall, wherein the first chamber is in flow communication at 9 with the aerofoil cavity for discharge of at least part of the cooling air entering the first chamber to the aerofoil cavity. A first platform 11 and a second platform 10 are provided, at opposite spanwise ends of the aerofoil for forming radially inner and



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outer shrouds in an array of circumferentially spaced nozzle guide vanes in the gas turbine engine. Plural projections 17 are provided in the first and second chambers for increasing the surface cooling area of the chambers.

Claims 1 and 9-10, as far as they are definite and understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Bourguignon 5,320,485. Note the nozzle guide vane 1 for a gas turbine engine, with the blade comprising an unnumbered aerofoil having a pressure wall 21a and a suction wall 21b and at least one aerofoil internal cavity 8 between the pressure and suction walls for conveying cooling air through the aerofoil, and at least one aerofoil platform 4 adjacent and generally perpendicular to the aerofoil, the platform having at least one internal cavity with an unnumbered pressure wall and an unnumbered suction wall on respective sides of the aerofoil on one side of the platform cavity, the platform cavity being divided into at least two chambers including a first chamber 23 for receiving cooling air for cooling the platform pressure wall and a second chamber 25 for receiving cooling air for cooling the platform suction wall, wherein the first chamber is in flow communication at 8 with the aerofoil cavity for discharge of at least part of the cooling air entering the first chamber to the aerofoil cavity. A first platform 4 and a second platform 3 are provided, at opposite spanwise ends of the aerofoil for forming radially inner and outer shrouds in an array of circumferentially spaced nozzle guide vanes in the gas turbine engine. Plural projections 57 are provided in the first and second chambers for increasing the surface cooling area of the chambers.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6, as far as it is definite and understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Dierberger 4,040,767 in view of Green 5,382,135. Dierberger discloses a nozzle guide vane substantially as claimed as set forth above, including plural cooling air exit apertures 36 at a downstream end of the platform, but does not disclose that the exit apertures comprise plural slots.

Green (figures 2-4) shows a cooled rotor blade with a platform cavity 62 which has plural exit apertures 58 in the form of slots, for the purpose of providing film cooling at a platform region 34 of the rotor blade.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the cooling air exit apertures 36 of Dierberger such that they are in the form of slots, as taught by Green, for the purpose of providing film cooling at the platform region. Although Green is directed to a rotor blade and Dierberger is directed to a guide vane, one of ordinary skill in the art would have readily recognized that the teachings of Green are also

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applicable to guide vanes, because the film type cooling is identical in both guide vanes and rotor blades.

*Prior Art*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

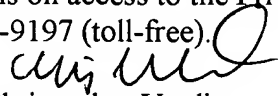
Shepherd, Finger, Whidden, Lafarge, and Calderbank are cited to show airfoil members having projections for increasing surface area cooling.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.V.  
March 6, 2005

  
Christopher Verdier  
Primary Examiner  
Art Unit 3745